



52Mn – a new PET tracer for imaging neural pathways

Napieczynska , Hanna; Severin, Gregory; Fonslet, Jesper; Menegakis, Apostolos ; Pichler, Bernd J.; Calaminus, Carsten

Publication date:
2016

Document Version
Peer reviewed version

[Link back to DTU Orbit](#)

Citation (APA):
Napieczynska , H., Severin, G., Fonslet, J., Menegakis, A., Pichler, B. J., & Calaminus, C. (2016). ⁵²Mn – a new PET tracer for imaging neural pathways. Abstract from 10th FENS Forum of Neuroscience 2016, Copenhagen, Denmark.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

^{52}Mn – a new PET tracer for imaging neural pathways

Napieczynska Hanna^{1,2}, Severin Gregory W.³, Fonslet Jesper³, Menegakis Apostolos⁴, Pichler Bernd J.¹, Calaminus Carsten¹

¹) Werner Siemens Imaging Center, Department of Preclinical Imaging and Radiopharmacy, Eberhard Karls University Tuebingen, Germany

²) International Max Planck Research School for Cognitive and Systems Neuroscience, Tuebingen, Germany

³) Technical University of Denmark, The Hevesy Laboratory, Center for Nuclear Technologies - Roskilde, Denmark

⁴) Department of Radiation Oncology, Medical Faculty and University Hospital, Eberhard Karls University Tuebingen, Germany

Aims

We aimed at imaging neural pathways with ^{52}Mn PET in rats and testing potential toxicity of the tracer to the dopaminergic neurons.

Methods

^{52}Mn was produced by proton irradiation of ^{nat}Cr and different purification methods were used in two experiments. In Experiment I 170kBq was injected to the right STR or VTA (n=8), in Experiment II – 20kBq to the VTA (n=18). PET was performed at 24h and the rotameter test at 3, 14 or 28 days post-injection. The brain tissue was used for TH- or γH2AX -staining.

Results

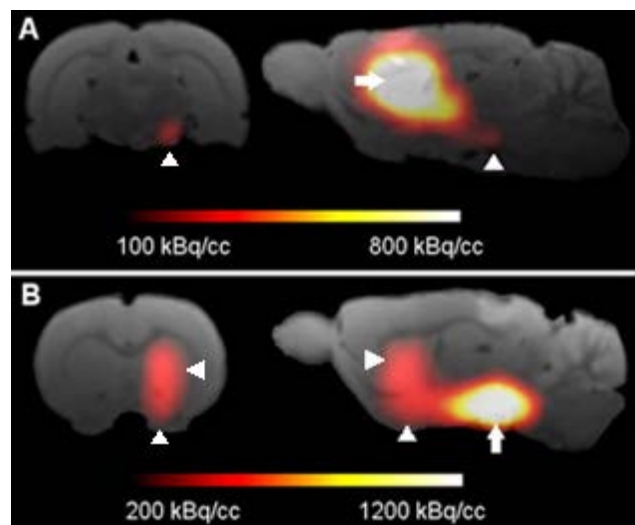
^{52}Mn transport along the direct and indirect striatonigral pathways could be seen after injection to the STR. In the “VTA group” the mesolimbic and nigrostriatal tracts were clearly delineated.

Purification method I resulted in higher metal contamination than method II.

In Experiment I, an increased ipsilateral vs contralateral rotation was observed in some animals. This corresponded to the dopaminergic lesion detected by the TH-staining. In contrary, no behavioral effect or dopaminergic damage was found in Experiment II. There was also no difference between the ^{52}Mn -injected and control brain tissues in the γH2AX -staining.

Conclusions

^{52}Mn traces neural pathways allowing their imaging with PET. The optimized experimental protocol prevents lesioning dopaminergic neurons and affecting the rotation behavior up to 4 weeks post-injection.



PET was performed 24h after ^{52}Mn injection to the STR (A) or VTA (B). The arrows point at the injection location and the arrowheads at the regions to which the tracer was transported: SN in A, NAc and STR in B.